

AYK REGION

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DIVISION OF COMMERCIAL FISHERIES

1984
YUKON AREA
SALMON REPORT

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BACKGROUND

Area Boundaries and Legal Gear

The Yukon area includes all waters of the Yukon River drainage in Alaska and coastal waters from Canal Point light near Cape Stephens to the Naskonat Peninsula. For management purposes, the area is divided into six districts and 10 subdistricts (Figure 1). Commercial and subsistence fishing occurs along the 1,200 mile length of the Yukon River (in Alaska) and in the lower 220 miles of the Tanana River. The Lower Yukon area (districts 1, 2 and 3) includes the coastal waters of the area and that portion of the drainage from the mouth to Old Paradise Village (river mile 301). The Upper Yukon area (districts 4, 5 and 6) is that portion of the drainage upstream of Old Paradise Village to the U.S./Canada border including the Tanana River drainage.

Legal commercial fishing gear consists of set and drift gill nets in the lower Yukon area and fishwheels and set gill nets in the upper Yukon area. Open skiffs powered by outboard motors are used to operate the fishing gear and deliver the fish to buyers. Subsistence gear commonly used to capture salmon include gill nets, fishwheels and beach seines.

General Management Objective

The overall objective of the Department's research and management programs is to manage the various salmon runs for optimum sustained yield. The commercial fishery is regulated on the assumption that a harvestable surplus, after providing for spawning and subsistence utilization requirements, is available.

Subsistence has been designated by the Legislature (State Law 151) as the highest priority among beneficial uses of fish and game resources. Except in areas where intensive commercial fisheries occur, the subsistence fishery is subject to few restrictions in order to give preference to subsistence users. The majority of Yukon River fishermen usually take salmon for both commercial and subsistence purposes in major commercial fishing areas. Therefore, in order to enforce commercial fishing regulations, it is necessary to place some restrictions on the subsistence fishery. For example, during the commercial salmon fishing season in most areas, subsistence fishing is allowed only during the open commercial fishing periods. During the course of the year, however, substantially more subsistence fishing time is allowed than commercial fishing time.

Management is made difficult by the character of salmon runs, the nature of the various fisheries (for example, the rapid evolution of the lower Yukon set net fishery into a drift net fishery), and the river itself. Since most of the commercial fisheries have only developed or expanded in recent years, there is a lack of adequate escapement and return data on which to fully evaluate the effects of increased commercial harvests. The various fisheries, which are scattered over 1400 river miles, harvest mixed stocks usually several weeks and hundreds of miles from their spawning grounds. Because the Yukon River commercial fishery is essentially a "cape fishery" (harvesting mixed stocks), some tributary populations may be under- or overharvested in relation to their actual abundance. For example, in a mixed-stock fishery, where it is impossible to manage each stock separately, some small spawning

populations may be reduced to very low levels or even eliminated.

New research projects are underway and other programs are planned, once additional funding becomes available, to obtain the biological information necessary for better management of the salmon runs. These include: (1) king salmon stock separation studies using scale analysis techniques (2) side-scanning sonar to obtain accurate daily and seasonal escapements in important tributaries (Arvik, Andreafsky, and Sheenjek Rivers), (3) expanded upper Yukon test fishing program, and (4) main river sonar feasibility study (near Pilot Point Station) to obtain index estimates of salmon abundance.

Management of the Yukon River commercial salmon fishery should be conservative because of the difficulty in determining run size, harvesting of mixed stocks, increased effort and efficiency of the commercial fleet, allocation problems, and the need to provide for upriver escapements and subsistence requirements. Important management techniques include establishing guideline harvest ranges, gill net mesh-size restrictions, weekly fishing periods, and season closures. If it becomes apparent during the fishing season (based on analysis of commercial catch and test fishery data) that the run is substantially smaller or larger than needed for escapement and subsistence requirements, commercial fishing time is adjusted through the use of the emergency order or, less frequently, emergency regulation authority.

Status of Fishery, Stocks, and Management Strategies

All five species of Pacific salmon occur in the Yukon River, with chums being the most abundant, followed by kings, cohos, pinks, and reds. Commercial salmon fishing (for kings) on the Yukon dates back to 1918, but the multi-species salmon fishery did not become fully developed until the mid-1970's. In the Alaskan portion of the Yukon, the average commercial salmon harvest for the period 1979 - 1983 is 1.4 million fish (Table 1). An average of 478,000 salmon is taken additionally each year for subsistence use.

Approximately 900 commercial fishermen (700 in the 3 lower districts) and 20 processors participate in the fishery. The ex-vessel value of the salmon catch has averaged \$7.6 million for the most recent 5 year period.

King salmon spawning populations are widely distributed throughout the Alaskan and Canadian portions of the Yukon River drainage. Major spawning streams in Alaska include the Andreafsky, Arvik, Nulato, Salcha and Chena Rivers; in the Canadian portion of the drainage (Yukon Territory), important king salmon systems include the Big Salmon and Nisutlin Rivers. King salmon escapement trends are shown in Figure 2.

Annual subsistence catches of king salmon in Alaska during 1963 - 1983 ranged from 12,000 - 49,000 (22,500 average). During the past 5 years, subsistence king catches have increased due to above average size runs (36,200 average) (Figure 3). In the Yukon Territory (Canada), the recent 5 year average is 8,400 kings.

During the period 1960 - 1971, the commercial catch of king salmon ranged from 67,600 to 129,700 and averaged 101,800. Yukon king salmon runs generally declined in magnitude during the early to mid-1970's, and average commercial harvests dropped to 83,700 during the period 1972 - 76. This decline of Yukon

River king salmon is partially attributed to interceptions by the Japanese high seas mothership fishery.

Since 1976 reductions in high seas interceptions (except 1980), a series of mild winters, and more restrictive management of the inshore fishery have combined to produce a series of above average king salmon returns. For the period of 1979 through 1983, average commercial harvests (in Alaska) increased to 142,200 (Table 1). During the same period, commercial catches in the Yukon Territory averaged 9,200 kings.

Timing of king salmon runs is highly variable, in response to spring weather conditions. Opening of the commercial fishery in the lower river is likewise variable and usually occurs between June 5 and June 15 by emergency order. The season is opened only after it is determined (by monitoring of test fishing and subsistence catches) that a sustained in-migration of fish is occurring and that the early portion of the run has passed through the lower river. This strategy allows fishery managers an opportunity to assess run strength prior to intensive commercial fishing effort, spreads fishing effort over a larger portion of the run, and affords subsistence fishermen an opportunity to harvest fish for their domestic needs prior to implementation of restrictive commercial fishing periods.

During the king salmon season, commercial and subsistence fishing in districts 1 and 2 are regulated by emergency order and are normally allowed for two-24 hour periods per week. Regulations adopted by the Board of Fisheries prior to the 1983 season allow an additional subsistence fishing period every other weekend in districts 1 and 2 through July 19. In district 3, fishing is allowed by regulation for two-36 hour periods per week, and in districts 4, 5, and 6 fishing occurs during two-48 hour periods per week. Duration and frequency of fishing periods may be changed by emergency order, depending on run strength as indicated by comparative commercial and test catches.

A guideline harvest range of 60,000 - 120,000 king salmon for districts 1 and 2 has been established by the Board of Fisheries. The midpoint (90,000) of this guideline harvest range should be the expected catch if the run is of average magnitude. The expected catch if the run is above average would be 90 - 120,000 kings. If an exceptionally large run occurs, as in 1981, then the upper end (120,000) of the guideline harvest range may be exceeded. Consequently, fishing time may be reduced in districts 1 and 2 to more evenly distribute harvest throughout the run, even in years of large runs. Commercial king salmon harvests in districts 3 - 6 are likewise regulated by guideline harvest ranges which allow an additional (combined) harvest of 7,350 to 9,150 kings.

Summer chums are the more abundant of the two chum salmon runs that occur in the Yukon River. Summer chums can be distinguished from fall chums by the following characteristics: (1) earlier run timing (early June to mid-July in the lower river); (2) rapid maturation in fresh water; (3) smaller body size (6 - 7 lbs.); (4) greater population size and (5) spawning occurs primarily in lower 600 miles of the drainage.

The Anvik River supports the largest spawning population; other important spawning areas include the Andreafsky, Nulato, Rodo, Salcha and Hogatza River drainages. With possible exceptions, Yukon summer chum stocks have not

experienced declining escapements, although runs fluctuate greatly in abundance from year to year. Documented harvests and escapements during recent years show minimum run sizes ranging from 1.2 to 5.6 million fish. Summer chum salmon escapement trends are shown in Figure 4.

Regulations regarding harvest and sale of summer-run chum salmon were liberalized beginning with the 1967 season. By 1973 all gillnet mesh-size restrictions were lifted in order to afford fishermen an opportunity to use small-mesh gill nets, which select for the more abundant chum salmon. Prior to this time, commercialization of this species had been limited because of its importance to upriver subsistence fisheries. Presently, the summer chum salmon subsistence fishery takes 236,000 fish annually (1979-1983 average) which is similar to the previous 5 year (1974-1978) average of 199,800.

The summer chum commercial fishery has developed rapidly in recent years. From 1967 through 1983 harvests ranged from 11,200 to 1.2 million fish, and the most recent 5 year average is 912,400 (Table 1). A regulation was promulgated prior to the 1976 season which established a range of dates (from June 27 to July 5 in districts 1 and 2, and July 5 to July 15 in district 3) after which only gill nets of 6-inch or smaller mesh can be used. This regulation serves not only to minimize capture of large female king salmon during the late portion of the king run, but also to optimize the harvest of the abundant summer chums migrating through the lower river fishery during late June - early July.

Management of summer chums is complicated by the fact that both king and summer chum salmon exhibit similar run timing. Because of the overriding importance of king salmon, the harvest of chums in the lower river is greatly dependent on the regulations and management strategies employed toward the more intensively managed king salmon fishery. Even if an exceptionally large run of summer chums develops, the harvest of that species may be no more than average because of restrictions imposed on the fleet for the conservation of kings.

Guideline harvest ranges are used to regulate the harvest of kings and fall chums but have not been established for summer chums.

The majority of summer chums harvested in the upper Yukon districts is taken in subdistrict 4-A. A statewide abundance of ocean-caught salmon in recent years has adversely affected the marketability of upriver summer chum salmon because of their relatively poor flesh quality; however, large amounts of high quality roe continue to be produced in this area.

Fall chums have the following differentiating characteristics from summer chum salmon: (1) later run timing (mid-July to early September in the lower river); (2) larger size (7 - 9 lbs.) and robust body shape and bright silvery appearance in the lower river; (3) smaller population size; and (4) spawning that occurs in the upper portions of the drainage in spring fed streams.

Major spawning areas are located in the Porcupine River drainage (Sheenjek River in Alaska and Fishing Branch River in Canada) and the Tanana River drainage in Alaska (Toklat River, Delta River, and mainstem Tanana upstream of Fairbanks). Spawning occurs during September through mid-November.

Porcupine River and upper Yukon fall chums are distinguished from Tanana River fall chums by their earlier run timing and their orientation along the north bank of the Yukon River (mile 530-700), as opposed to the south bank orientation of Tanana drainage fall chums.

Substantially different escapement trends have been observed for some of the major spawning populations. Escapements in the upper Tanana River were strong in 1979-1981 and 1983 but have been depressed in recent years in the Toklat, Sheenjek, and Fishing Branch Rivers (Figure 4). Fishing Branch River escapement information has been quite limited in recent years due to poor survey conditions, but a decline in escapements is apparent (Figure 5).

Use of tag and recovery data resulted in population estimates of 197,000 and 412,000 fish during 1976 and 1977, respectively. Minimum annual population estimates based on documented harvests and escapements range from 331,000 to 841,000 since 1975.

Fall chum subsistence catches in Alaska average 184,100 annually (1979-1983), more than double the previous 5 year average (1974-1978) of 86,500 (Figure 2). An additional 8,300 fall chums are taken annually (recent 5 year average) in the Yukon Territory (mostly at Old Crow) and the recent 5 year average catch is 8,300 which is similar to previous 5 year average (1974-1978).

Commercial fall chum catches in Alaska since 1961 have ranged from 8,300 to 486,100, and the recent 5 year average (1979-1983) harvest is 335,900 compared to 1974-1983 average of 244,900. In the Yukon Territory, the recent 5 year average catch is 14,100 fish compared to the 1974-1978 average of 2,800.

In response to the poor run experienced during 1982, difficulties in assessing in-season run strength, and the increasing efficiency of the fleet, the Alaska Board of Fisheries adopted several important regulatory restrictions. These restrictions were required to help prevent overharvesting of specific run segments and to distribute the harvest throughout the run. The following is a summary of changes implemented by the Board:

1. Commercial Fishing Season

Provides for an approximate 7 day closure of the commercial fishing season for the lower Yukon area during the early portion of the fall chum run (Porcupine River - upper Yukon stocks). The season closure is implemented by emergency order on a staggered basis for each district. The following example depicts the probable sequence of closures for each district based on a fall chum run of normal timing:

District 1: July 19 through July 25

District 2: July 22 through July 28

District 3: July 25 through July 31

2. Set-Net-Only Area

During the fall chum commercial fishing season in coastal areas of district 1, commercial fishermen are restricted to the operation of set gill nets in a special "Set-Net-Only" area. Commercial fishermen must register to fish the set-net-only area and may not fish for commercial purposes in other areas of district 1 or in districts 2 or 3 during the remainder of the commercial fishing season. Commercial fishermen registered to fish in the set-net-only area may not fish for subsistence

with drift gill nets in districts 1, 2, and 3, and subsistence fishing with drift gill nets in the set-net-only area is prohibited during the remainder of the commercial fishing season.

3. Weekly Fishing Periods

Based on emergency order authority, a fishing schedule of two-24 hour periods per week is allowed in the set-net-only area. In other areas of district 1 and in district 2, both set and drift gill nets may be operated for two-12 hour fishing periods per week during the commercial fishing season. A daylight fishing schedule for the 12 hour periods (e.g 6 a.m. to 6 p.m.) provides for fishermen's safety. In district 3, the fishing schedule consists of two-24 hour periods per week.

4. Guideline Harvest Range

The fall chum salmon commercial fishery is governed by a flexible guideline harvest range of 120,000 to 220,000 fish for districts 1, 2, and 3 combined. The Board of Fisheries directed the Department to target toward the lower end of the present guideline harvest range unless the run is of very large magnitude. If the fall chum run is of below average to average magnitude, then the harvest should approximate 120,00 - 170,000 fish. If the fall chum run is exceptionally large, then a greater harvest may be taken, but the upper end of the guideline harvest range (220,000) should not be exceeded. Guideline harvest ranges for the upper river districts are established to include incidental harvests of coho salmon. Combined guideline harvest levels for the upriver districts are 25,500-100,500.

5. Subsistence Fishing

The aforementioned reduced commercial fishing periods affect the subsistence fishery since fishing time for both fisheries is coincidental. An additional fishing period (24 hours) each weekend for subsistence is allowed in district 1 (excluding the set net area) and in district 2 after the reopening of the fishing season in late July by emergency order. Once the commercial fishing season is closed, subsistence fishing is allowed 7 days per week by regulation.

The overall commercial guideline harvest range of 145,500 - 320,500 fall chum was established on the assumption that the commercial harvest will not impinge on spawning ground requirements or subsistence needs. Due to trends of increasing subsistence utilization and decreasing escapements for some stocks, a further reduction in commercial harvests may be required to properly conserve fall chum salmon.

Commercial and subsistence chum salmon catches are depicted in Figure 6.

Coho salmon enter the river during August and early September. Escapement information is very limited. Comparative escapement information for this species is available only from the Tanana River drainage, where escapements appear to have been relatively stable during the last 10 years. The Delta Clearwater River near Delta Junction supports the largest known population within the Yukon drainage.

The commercial harvest of coho salmon in the lower Yukon area is dependent

upon the timing and duration of the fall chum season. Coho migration in the lower river peaks during mid- to late August. Cohos are taken incidentally to the fall chum fishery in most districts but in some years contribute substantially to the commercial and subsistence harvests in the Tanana River. Commercial catches in the Yukon area during the period 1979 - 1983 have averaged approximately 20,000 cohos (Table 1). Approximately 20,000 cohos are also taken annually (recent 5 year average) for subsistence.

1984 SEASON SUMMARY

Area Summary

In 1984, a total of 1,168,112 salmon was harvested commercially in the Yukon area. The catch was composed of 119,904 kings; 755,724 summer chums; 210,560 fall chums; and 81,940 cohos (Table 2). The king salmon and combined summer and fall chum salmon harvest was 16% and 29% below the previous 5 year averages. The 1983 coho salmon harvest was the largest on record and more than triple the recent 5 year average.

Yukon River fishermen received an estimated \$5,685,000 for their catch, down 25% compared to the recent 5 year average. Nine processors operated in the lower Yukon area, and 14 processors and 10 catcher-sellers operated in the upper Yukon area.

Markets for upper Yukon king salmon were depressed and prices were below average (\$0.95 per lb.) compared to recent years. However, due to strong markets and increased competition between buyers, prices paid for king salmon in the lower Yukon area were the highest on record (\$1.50 per lb. average). Chum prices were depressed in the lower Yukon areas, averaging approximately \$.26 (summer chums) per lb. and \$.32 (fall chums). In the upper river chum prices increased compared to 1983 averaging \$.23 for summer chums and \$.26 for fall chums. Coho prices averaged \$.50 per lb. in the lower Yukon and \$.24 per lb. in the upper Yukon area. Fishermen in the upper river received \$1.78 per lb. for salmon roe.

Subsistence harvest survey information is still being compiled, but it is projected that the catch will approximate 40,000 kings; 300,000 summer chums; 175,000 fall chums; and 35,000 cohos.

King Salmon

The Yukon River experienced a late breakup during 1984, as the river was not free of ice until June 1. The first king salmon was reported to have been caught at Pitka's Point on June 5, but no significant catches were made at the ADF&G test fishing site (river mile 24) until June 12.

In accordance with the management strategy previously described in this report and in the 1984 Yukon Area Management Plan, the early portion of the run was allowed to pass through the fishery prior to the opening of the commercial fishery. The fishing season opened June 18 in district 1, June 20 in district 2 and June 28 in district 3.

Commercial and test fishing catch data indicated the king salmon run to be slightly above average in magnitude. The management plan provides for the midpoint of the 60,000 to 120,000 king salmon guideline harvest for districts 1 and 2 combined to be taken if the run is of average magnitude. As of June

29, approximately 95,000 kings had been harvested in districts 1 and 2 primarily with large mesh king salmon nets. The decision was then made to "close the king salmon season" (fishing with unrestricted mesh gill nets) and to allow only gill nets of 6 inch or smaller mesh gill nets to be fished effective July 1 in districts 1 and 2. It was anticipated that an additional 10 - 20,000 kings would be taken with 6 inch or smaller mesh gill nets. At the time of the closure, district 1 had four-24 hour fishing periods and district 2 had three-24 hour fishing periods, the least amount of fishing time ever allowed during the "king salmon season" in this district. A total of 16,912 kings was taken with 6 inch or smaller mesh gill nets in districts 1 and 2 resulting in a total season harvest of kings was 74,671 in district 1 and 36,697 in district 2. In district 3, which is managed under a 1,800 to 2,200 guideline harvest range, a total of 3,039 king salmon was taken.

Fishing time has been steadily reduced in the district 1 and 2 king salmon fishery in recent years because of increased fishing effort and efficiency. Reductions in fishing time have been controversial among fishermen especially in regards to equal fishing time between districts 1 and 2. As a result an allocation issue exists between both districts. In addition the Department's present management strategy of delaying the opening of the commercial fishing season to afford protection of the early king run has been criticized and public proposals have been submitted to establish a fixed opening date. The staff will review the lower Yukon king salmon management strategy and regulations during the oral report and proposal deliberations.

In district 4, as in past years, a weak market and a desire on the part of commercial fishermen to retain king salmon for subsistence use combined to keep commercial landings at a low level (961 kings). The majority of these fish (83%) was caught by a single catcher-seller in the upper portion of the district.

Based on indications of run strength from the lower Yukon and on comparative commercial catches from district 5, an attempt was made to close the fishery at or near the mid-point of the (subdistricts 5-A, 5-B, and 5-C) guideline harvest range. The commercial fishery was closed by emergency order on July 12, at which time the catch was estimated to be approximately 2,500 kings. Late arriving fish tickets, primarily from catcher-sellers, brought the final total to 3,285 king salmon. Peak catches in the lower portion of the district were made during the last period of the season.

In subdistrict 5-D (which is managed independently of the lower portions of the district) only one fisherman participated in the commercial king salmon fishery during 1984. The fishery in the Circle area (based on commercial landings) peaked during the week of 7/22 and the season was closed by emergency order on August 7. A total of 384 kings was taken in this subdistrict.

The first reported king salmon in district 6 (Tanana River) was taken at Fairbanks on July 7. Peak catches occurred during the period July 9 - 11. Total commercial catch for the district was 867 kings.

Observed escapements, although limited by unfavorable weather and stream conditions in the middle Yukon River drainage and in the Tanana River, were considered overall above average in magnitude. Escapements in the following

major index areas were observed: Andreafsky River (4,466), Little Salmon River (434), Big Salmon River (1,044), Nisutlin River (1,178) and Whitehorse Dam (980). Escapement trends are shown in Figure 2.

Summer Chum Salmon

Similar to king salmon, the summer chum run was also late. The first summer chum was caught on June 8 in Department test nets. Test net catches increased very sharply thereafter averaging more than 200 per day in one single 5 1/2 inch 25 fathom net from June 12 - 18, prior to the opening of the commercial fishing season in district 1. As in 1982, the summer chum run peaked in district 1 during the early season (June 18-29). Due to poor market conditions, processors discouraged fishermen from making deliveries or did not purchase summer chums in district 1 in order to process the more valuable kings. Some fishermen were catching up to 200 chums per drift with small mesh gear but in most cases were unable to sell their catch. Although the summer chum run was very strong, only 530,596 were taken in the lower Yukon area which was 22% below the recent 5 year average of 678,167.

A fishermen's strike idled approximately 15 fishermen in the Nulato area of subdistrict 4-A for the entire season and depressed fishing effort levels in subdistricts 4-B and 4-C during the early portion of the summer run. Effort levels for the entire district were down approximately 32% from the 1979-1983 average.

Deliveries of chum salmon roe were first made in the lower portion of subdistrict 4-A on June 20. Salmon roe production peaked during the period which ended on July 10 when 34,523 pounds of (chum) roe were delivered by 41 fishermen. A total of 166,842 pounds of roe was sold in the district (Table 3).

Summer chums in district 5 were sold only incidentally to the king salmon fishery; a total of 692 chums was commercially harvested.

Three processors and 27 fishermen combined to produce a record of 56,585 summer chums from district 6 (Tanana River). This catch exceeds by 46% the previous record of 38,837 taken in 1980. Unlike the district 4 summer chum salmon fishery, processors in this area are able to purchase and market summer chums, and as a result, only 335 lbs. of roe were sold during the summer season. The run, as judged by commercial deliveries, peaked during the 7/23 - 25 period when approximately 10,000 chums were delivered by 18 fishermen. Fishermen in the Nenana area harvested 75% of the summer chum catch of Tanana River summer chums. The season was closed by emergency order on August 12.

Escapement of summer chums to Yukon River tributaries was generally strong (Figure 4). The Anvik River chum escapement (sonar estimate) of 891,028 was approximately 46% above the recent 5 year average. In the West Fork of the Andreafsky River 238,565 chums were enumerated by aerial survey. Inclement weather and high water conditions precluded accurate surveys of summer chums in the middle Yukon and Koyukuk River drainages.

Fall Chum Salmon

The first fall chums were observed in the district 1 commercial fishery during the period of July 9-10 when it was estimated that fall chums comprised 10% of the chum catch. The percentage of fall chums increased steadily in Department test nets after mid-July and by July 25 essentially all were fall chums. The fishing season was closed effective July 17 in district 1 and July 18 in district 2 to afford protection for the early fall chum run which was believed destined primarily for the Porcupine River and Yukon Territory streams. A total of 28,718 chums was caught toward the fall chum guideline harvest range in districts 1 and 2 when the season closed.

In accordance with the Yukon Area Salmon Management Plan and regulations adopted by the Board last year, the fall chum fishery in 1984 was closed 12 days (versus 8 days in 1983) during late July. The longer closure in 1984 was judged necessary because of below average run strength as indicated by test fishing catch data.

The commercial fishing season was reopened on July 30 in district 1, August 1 in district 2 and August 3 in district 3. Due to below average abundance indicated in both commercial and test fishing data, the fishery was closed effective August 7 in district 1, August 8 in district 2 and August 10 in district 3. At the time of the closure a total of 111,896 fall chums had been harvested.

During the closure, subsistence fishermen in the Tanana-Rampart area of district 5 reported catching very large numbers of fall chums which indicated that the early fall chum run may have been of larger magnitude than indicated in lower Yukon catch data. Although only moderate numbers of fall chums entered the lower Yukon River during the closure, it was decided to reopen the commercial fishing on August 13. The fishery remained open for one week to allow the fall chum catch to approach the midpoint (170,000) of the guideline harvest range. The fishery was closed on August 19. The total fall chum harvest was 155,983 for the lower Yukon area (Table 2).

A total of 7,625 chums and 2,215 pounds of roe was taken commercially during the district 4 fall season. This catch was 50% below the recent 5 year average. Catches peaked during the 8/29-31 period when 1,700 chums and 400 cohos were landed by 11 fishermen.

Based on an evaluation of subsistence catches in the lower portion of district, a decision was made to open the commercial fishery in district 5 for one-24 hour period on August 15. Comparative catch data appeared to warrant additional harvest and two additional 24 hour periods were allowed. The total fall chum harvest for subdistricts 5-A, 5-B, and 5-C was 21,145. On September 7, when the run was well distributed throughout the upper portion of the district, the season in subdistrict 5-D was opened for a four day period. During the opening, an additional 1,781 chums were taken by three fishermen for a season total of 2,913 chums in subdistrict 5-D..

The latest fall chum salmon fishery occurs in the Tanana River which was managed conservatively due to accumulated information that the run magnitude was average at best. In accordance with the Yukon area management plan, the Tanana River fall chum fishery opening was delayed until the run was well

distributed throughout the lower and middle portions of the river. Distribution and abundance are determined by analysis of subsistence and test fishing catch data at Manley and subsistence catch data from the Nenana and Fairbanks areas. The season was opened by emergency order on September 14 and was closed on September 17 after two-24 hour periods and a catch of 20,620 fall chum salmon was made..

Fall chum salmon escapement information was incomplete at the time this report was written. In the Sheenjek River (Porcupine River drainage) a total of 24,420 chums, enumerated by side-scan sonar, was the lowest escapement documented in the four year history of the project (Figure 5). Also only 7,000 chums were observed by aerial survey in the Fishing Branch River (Porcupine River). In the Chandalar River an aerial survey documented 4,263 chums which is considered an average escapement. In the upper Toklat River a total of 9,200 chums were estimated by aerial survey, considerably below the escapement objective of 22,000. Complete fall chum (and coho) salmon escapement information will not be available until early November.

Coho Salmon

The first coho salmon was caught in the district 1 commercial fishery during July 16-17. Test fishing cumulative catches through August 10 were by far the largest ever recorded indicating an exceptionally strong run. In most years the commercial coho catch in the lower Yukon is minimal since the fishery is usually closed by mid-August because of fall chum salmon management problems. After the commercial fishery was reopened August 13-15 a total of 55,794 cohos was taken which represented 77% of the season catch in districts 1 and 2. Record period and total season catches were also taken in district 2. The record lower Yukon coho catch of 73,008 was attributed to the very large run and the later fishing season. In district 4 a record 1,100 cohos were harvested, the majority of which were from subdistrict 4-C. No coho salmon were commercially harvested in district 5. In district 6 a total of 7,688 cohos was taken.

OUTLOOK FOR 1985

King Salmon

In most years, the dominant age class returning is 6 year-old-fish; however, 5- and 7-year-old fish also contribute to the run. The 1979 brood year run (6-year-olds in 1985) was judged above average in abundance as indicated by comparative catch and escapement data. The return of 5-year-olds (1980 brood year) is expected to be substantial, based on above average run strength in 1980. Seven-year-olds are expected to contribute significantly to the run in 1985, based on the average return of 6-year-olds in 1984. In summary, based on evaluation of brood year run size data, it is expected that the 1985 Yukon River king salmon run will be average to above average in magnitude. The expected commercial harvest is expected to total 90,000-120,000 fish.

Summer Chum Salmon

Normally, Yukon River summer chum salmon runs are primarily composed of 4-year-old fish, although in some years 5-year-old fish are present in large numbers. The return of 4-year-olds in 1985 will be greatly dependent on the

strength of the 1981 brood year and the survival of the resulting offspring. Based on the available catch and escapement data, the magnitude of the 1981 summer chum salmon run was considered exceptionally strong. The return of 4-year-olds in 1985 is expected to be above average in magnitude. The return of 5-year-olds is expected to be substantial based on the above average return of 4-year-olds in 1984. In summary, the magnitude of the Yukon River summer chum salmon run in 1985 is expected to be above average. The commercial harvest is expected to total 600,000-1,200,000 fish.

Fall Chum Salmon

Similar to the summer run, the majority of the fall chum returning each year 4-year-old fish. Based on comparative catch and escapement information, the 1981 brood year (4-year-olds) was considered above average in magnitude. The return of 5-year-olds (1980 brood year) is not expected to be significant because of the below average to average return of 4-year-olds in 1984. In summary, the 1985 Yukon River fall chum salmon run is expected to be average to above average in magnitude. The expected commercial harvest should approximate 233,000 fish, the midpoint of the guideline harvest range for the entire river unless a more conservative management approach to bolster recent escapement declines is taken.

Coho Salmon

The coho salmon run is much smaller than the fall chum run, and the harvest is dependent on the duration of the fishery for fall chums. The commercial coho catch is expected to total 20,000-30,000 fish.

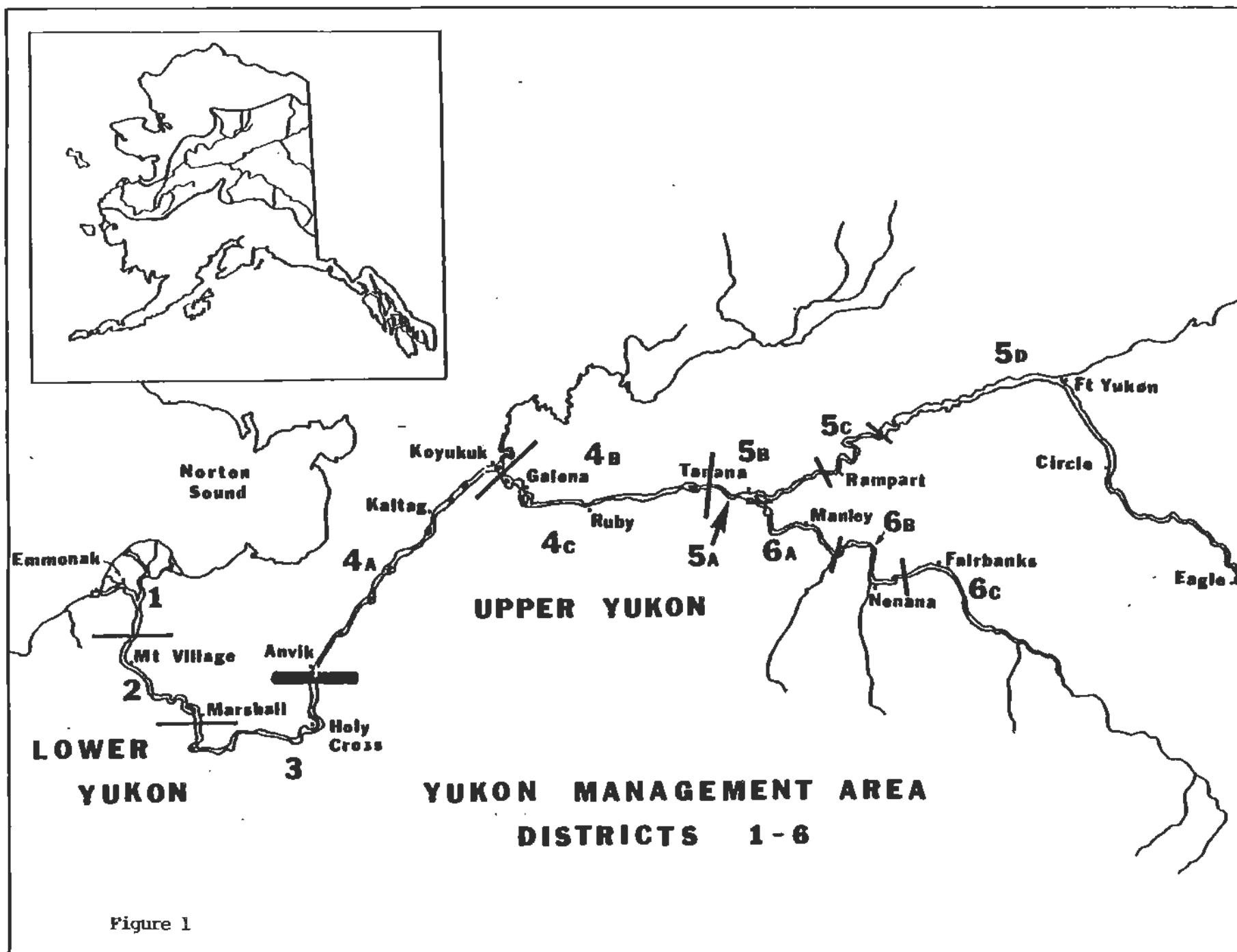


FIGURE 2: KING SALMON ESCAPEMENTS (THOUSANDS OF FISH) IN SELECTED YUKON TRIBUTARIES, 1960-1984. A/

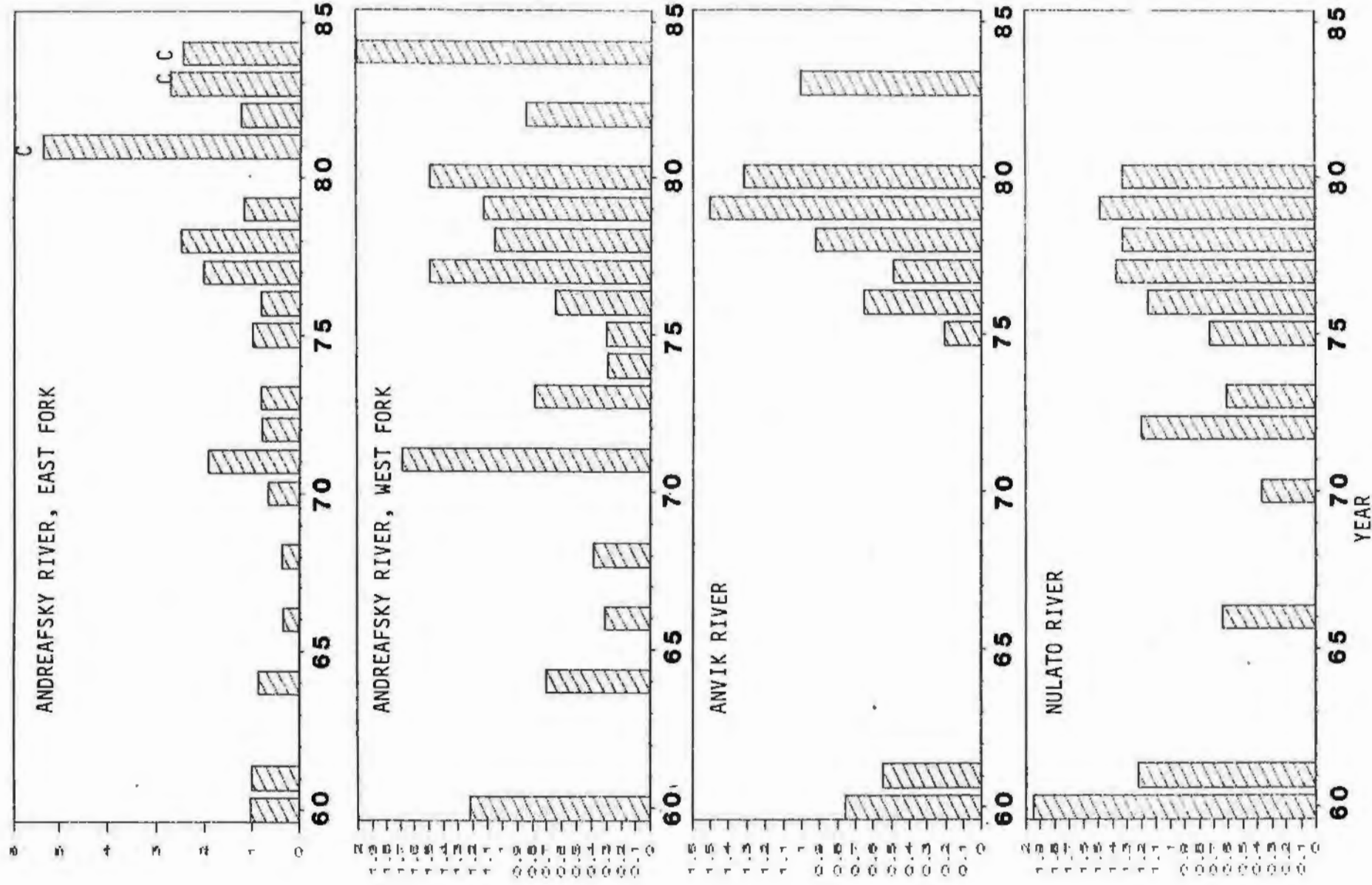


FIGURE 2: KING SALMON ESCAPEMENT (THOUSANDS OF FISH) IN SELECTED YUKON RIVER TRIBUTARIES, 1960-1984. (continued) A/

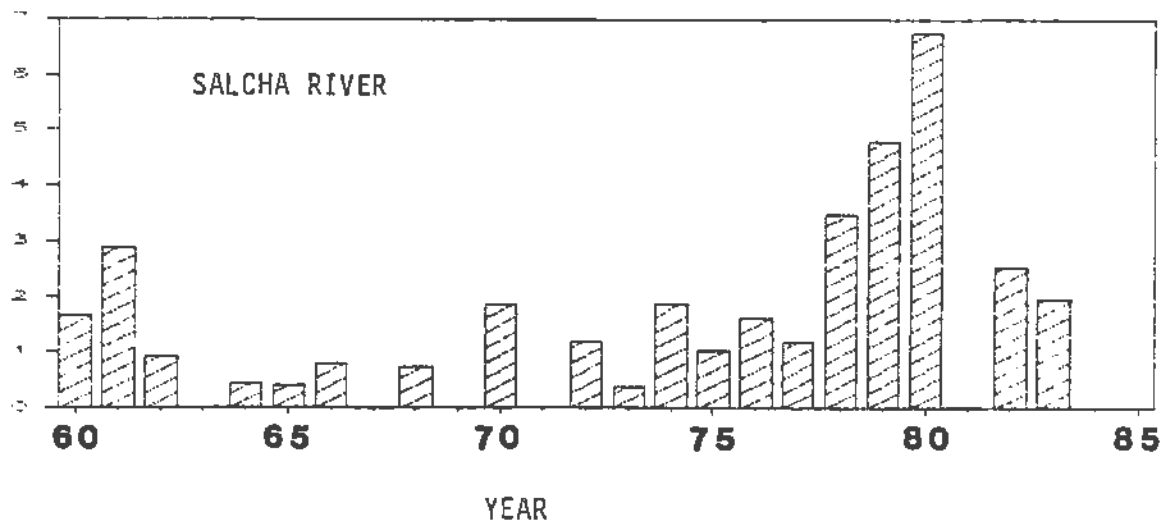
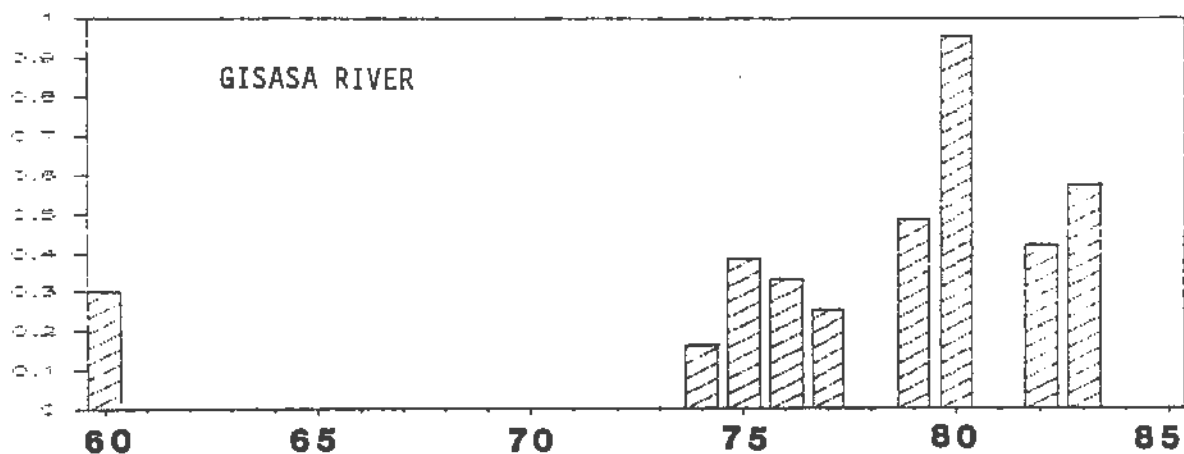
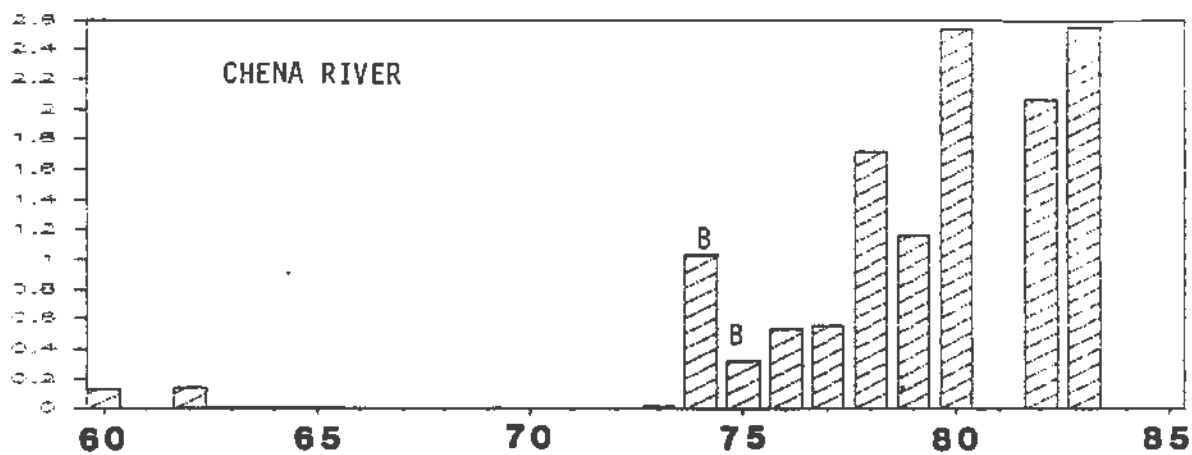
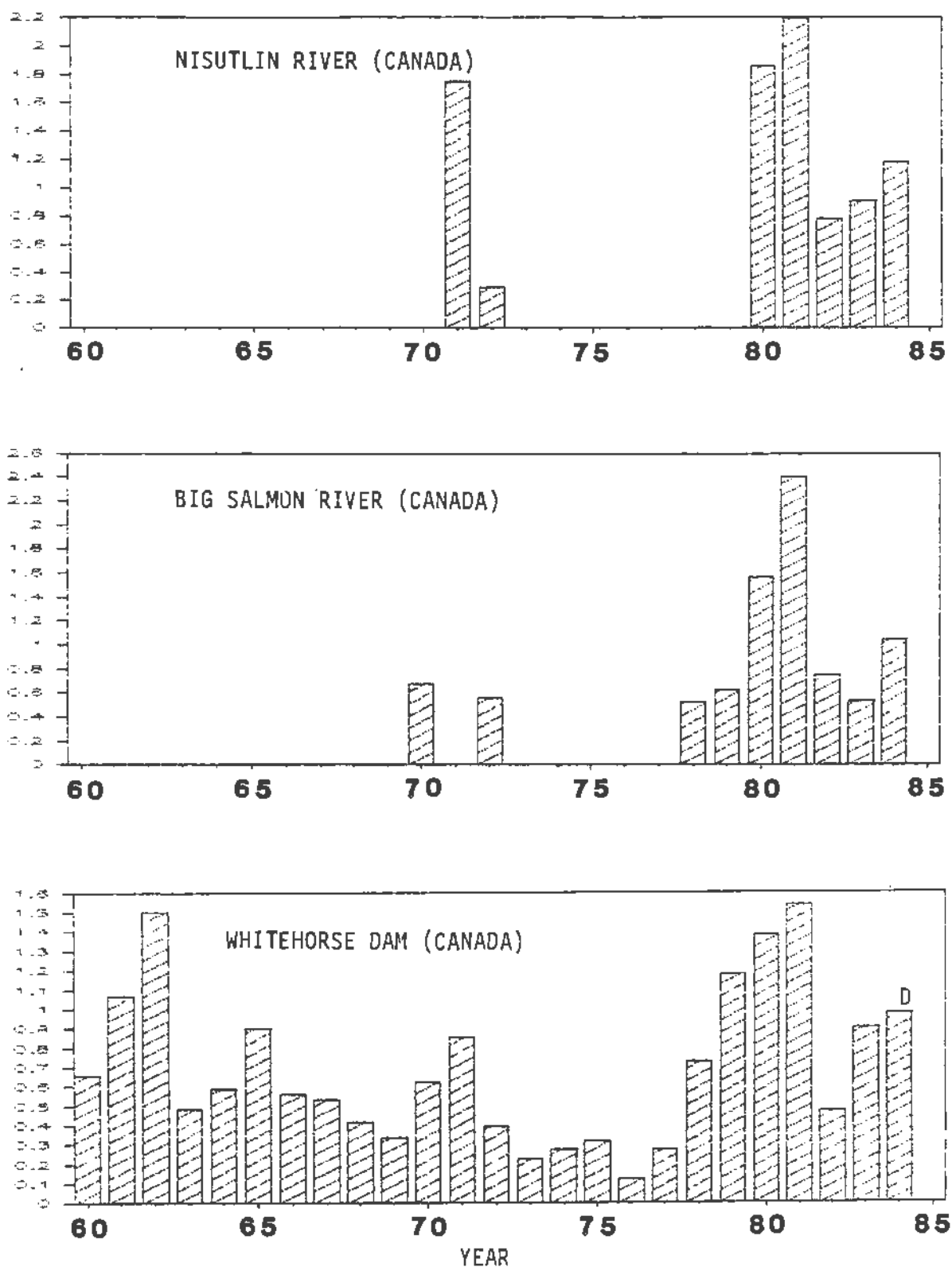
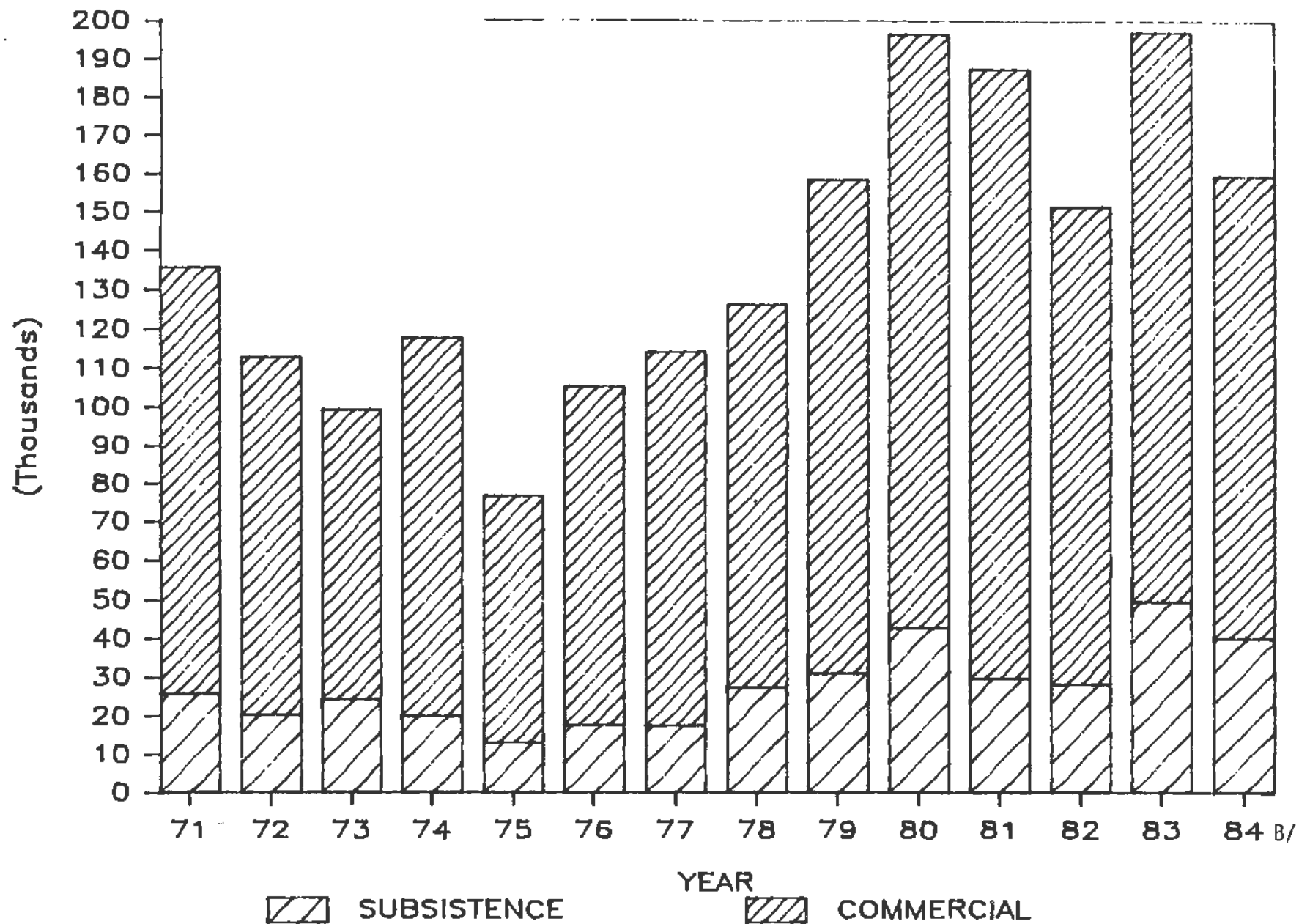


FIGURE 2: KING SALMON ESCAPEMENTS (THOUSANDS OF FISH) IN SELECTED YUKON RIVER TRIBUTARIES, 1960-1984. (continued) A/



- A/ Aerial survey counts made under good or fair conditions. Whitehorse Dam is total count from fishway.
 B/ Boat survey.
 C/ Sonar estimate
 D/ Preliminary data

FIGURE 3: YUKON AREA COMMERCIAL AND SUBSISTENCE SALMON CATCHES, 1971-1984 A/



A/ Does not include Canadian catches

B/ Preliminary estimate

FIGURE 4: SUMMER CHUM SALMON ESCAPEMENTS (THOUSANDS OF FISH EXCEPT ANVIK RIVER WHICH IS IN MILLIONS) IN SELECTED YUKON RIVER TRIBUTARIES, 1974-1984. A/

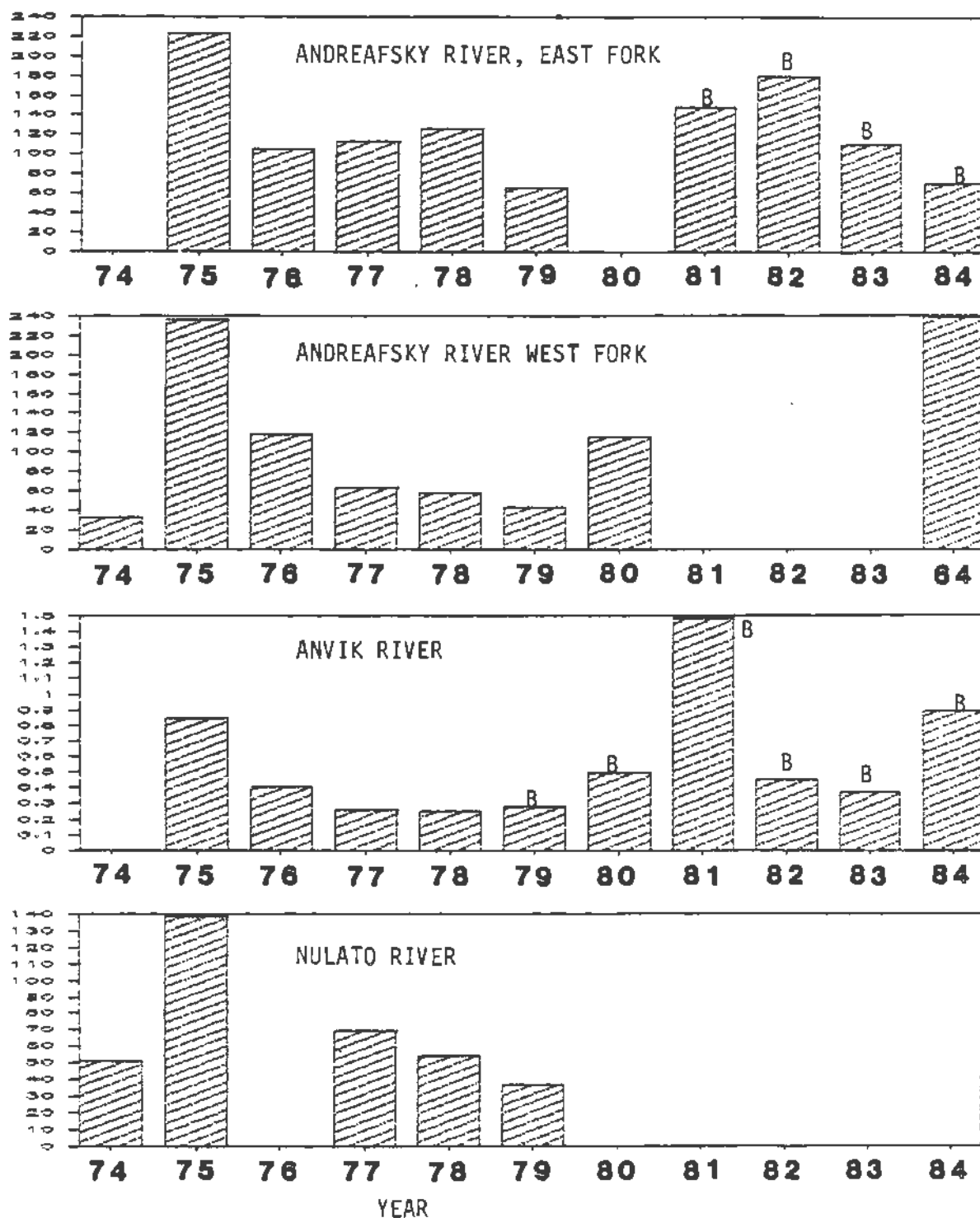
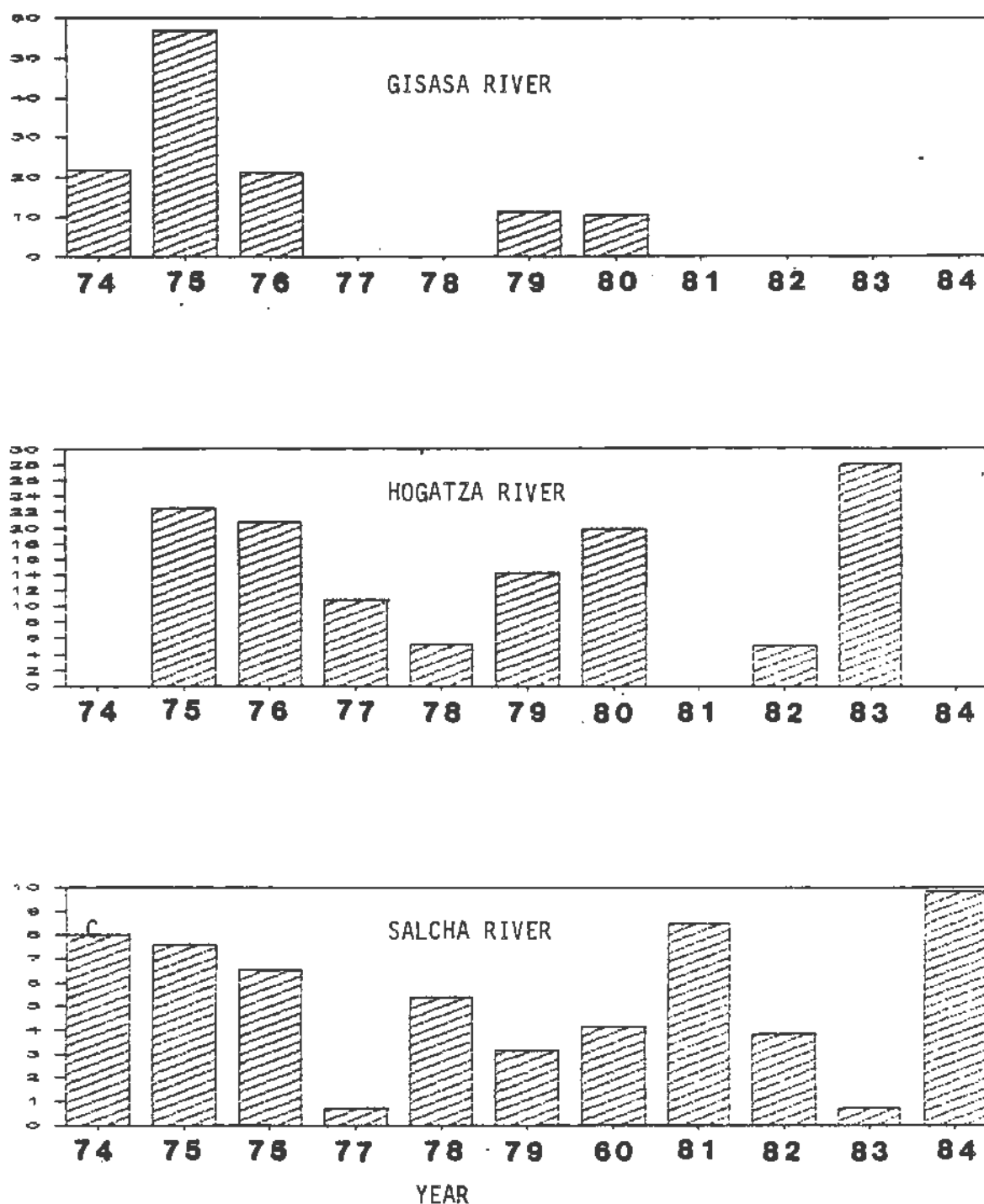
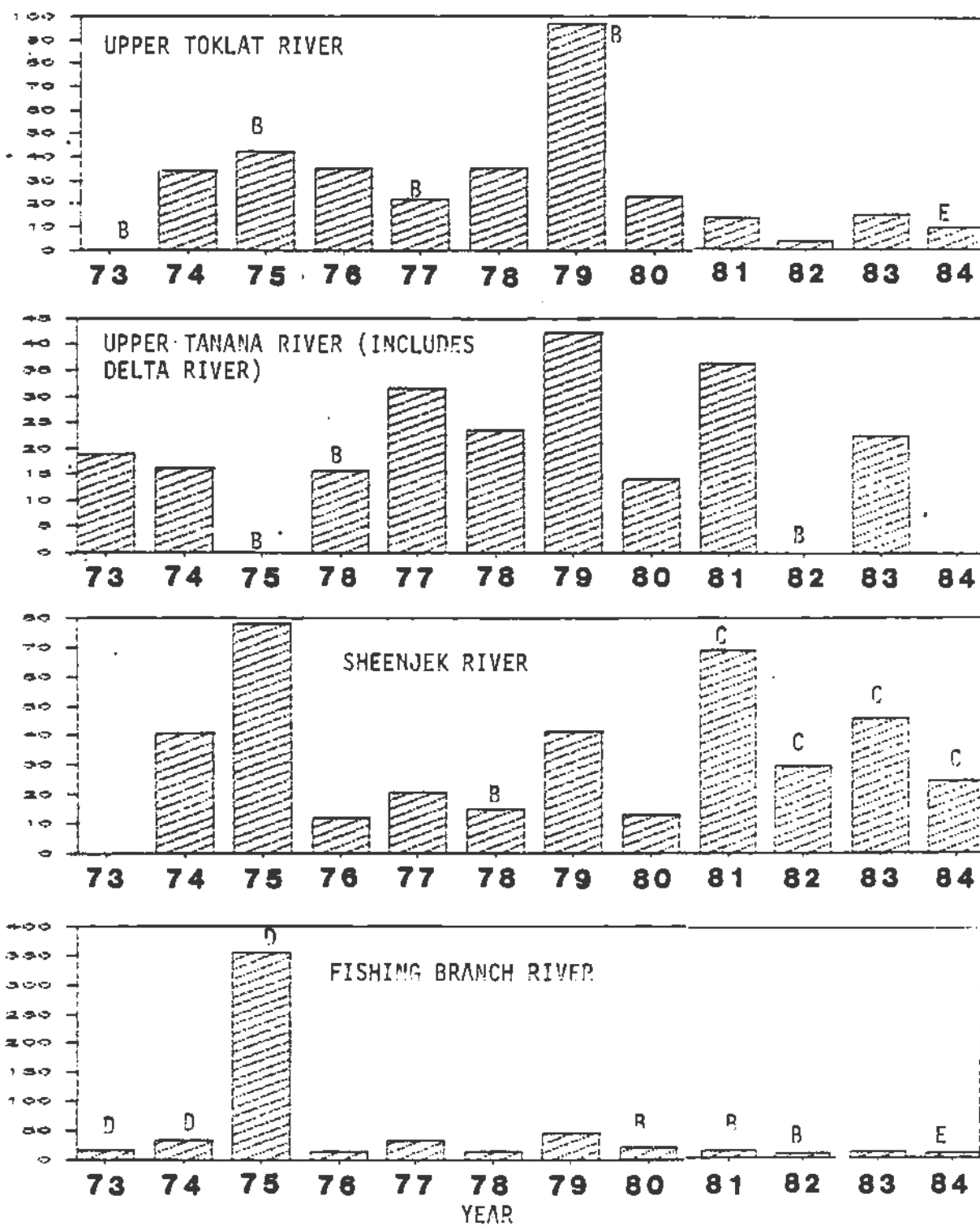


FIGURE 4: SUMMER CHUM SALMON ESCAPEMENTS (THOUSANDS OF FISH) IN SELECTED YUKON RIVER TRIBUTARIES, 1974-1984. (continued) A/



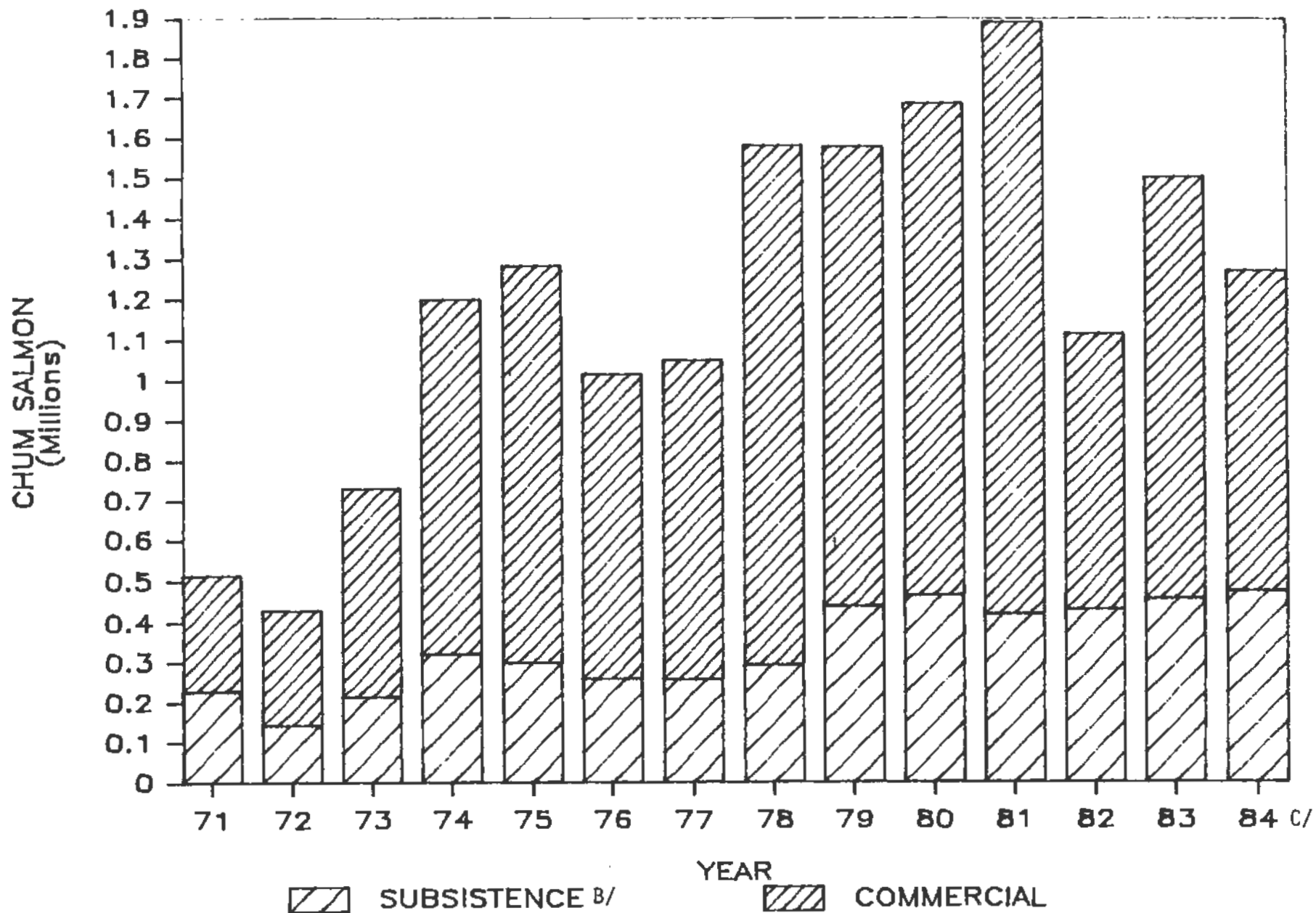
- A/ Aerial survey estimates except Anvik River, which represents total escapements from aerial survey, counting tower and sonar methods.
- B/ Escapement estimate from sonar count.
- C/ Combined aerial and boat survey.

FIGURE 5: FALL CHUM SALMON ESCAPEMENTS (THOUSANDS OF FISH) IN SELECTED YUKON RIVER TRIBUTARIES, 1973-1984. A/



- A/ Aerial and ground survey estimates
- B/ Incomplete survey
- C/ Sonar count
- D/ Weir count
- E/ Preliminary data

FIGURE 6: YUKON AREA COMMERCIAL AND SUBSISTE. CHUM SALMON CATCHES, 1971-1984. A/



- A/ Does not include Canadian catches
 B/ Includes small numbers of pink and coho salmon
 C/ Preliminary estimate

Table 1. Commercial salmon catches, Yukon area, 1961 - 1984. a/

Year	King	Summer chum b/	Fall chum b/	Total chum b/	Coho b/	Total b/
1961	120,260	-	42,577	42,577	2,855	165,692
1962	94,374	-	53,160	53,160	22,926	170,820
1963	116,994	-	-	-	5,572	122,566
1964	93,587	-	8,347	8,347	2,446	104,380
1965	118,098	-	23,317	23,317	350	141,765
1966	93,315	-	71,045	71,045	19,254	183,614
1967	129,706	11,179	38,274	49,453	11,047	190,206
1968	106,526	14,470	52,925	67,395	13,303	187,224
1969	90,223	60,569	131,291	191,860	14,981	297,064
1970	80,269	137,368	209,356	346,724	12,245	439,238
1971	110,507	100,090	189,594	289,684	12,203	412,394
1972	92,840	135,668	152,176	287,844	22,233	402,917
1973	75,353	285,844	232,090	517,934	36,641	630,029
1974	97,919	604,210	273,158	877,368	16,240	993,402
1975	63,740	728,156	265,156	993,312	2,346	1,050,945
1976	88,671	598,227	163,282	761,509	5,197	855,377
1977	96,414	548,958	248,739	797,697	38,021	932,096
1978	97,602	1,045,092	243,737	1,288,829	25,960	1,412,391
1979	129,056	803,500	362,480	1,165,980	17,110	1,312,146
1980	155,088	1,057,761	298,123	1,355,884	8,741	1,519,713
1981	157,607	1,191,812	486,059	1,677,871	23,702	1,859,180
1982	123,658	614,166	225,021	839,187	37,176	1,000,021
1983	147,910	894,878	307,662	1,202,540	13,320	1,363,770
1984 c/	119,904	755,724	210,560	966,268	81,940	1,168,112
5 yr average (1979-1983)	142,664	912,423	335,869	1,248,292	20,010	1,410,966

a/ Does not include Canadian catches.

b/ Includes "equivalent numbers" of salmon converted from roe sales.

c/ Preliminary data.

Table 2. Yukon area commercial salmon catch and effort data, 1984. a/

District / Subdistrict	Fishermen	Kings	Summer chum b/	Fall chum b/	Total chum b/	Cohos	Total
1	439	74,671	292,466	78,751	371,201	29,472	475,344
2	213	36,697	237,041	70,803	307,844	43,064	387,605
3	20	3,039	1,089	6,429	7,518	621	11,178
Total Lower Yukon	672	114,407	530,596	155,983	686,563	73,157	874,127
4-A	37	2	148,570	-	148,570	-	148,572
4-B	15	272	15,843	4,183	20,026	412	20,710
4-C	12	687	3,438	5,657	9,095	683	10,465
Subtotal District 4	58	961	167,851	9,840	177,691	1,095	179,747
5-A	5	128	50	1,415	1,465	-	1,593
5-B	20	1,589	625	10,329	10,954	-	12,543
5-C	23	1,568	12	9,403	9,415	-	10,983
5-D	3	384	5	2,970	2,975	-	3,359
Subtotal District 5	48	3,669	692	24,117	24,809	-	28,478
6-A	5	-	3,769	2,782	6,551	926	7,477
6-B	20	375	42,384	11,809	54,193	5,360	59,928
6-C	8	492	10,432	3,194	13,626	720	14,838
Subtotal District 6	33	867	56,585	20,620	77,205	7,688	85,760
Total Upper Yukon	139	5,497	225,128	54,577	279,705	8,783	293,985
Grand Total	811	119,904	755,724	210,560	966,268	81,940	1,168,112

a/ Preliminary Data

b/ Includes "equivalent numbers" of salmon converted from roe production.

Table 3. Upper Yukon area salmon and salmon roe production 1984^{a/}.

Subdistrict	No. of Fishermen	Kings	Summer Chums			Fall Chums			Cohos
			Chums	Chum Roe	Equiv. Chums	Chums	Chum Roe	Equiv. Chums	
4-A	37	2	51	148,519	148,570	0	0	0	0
4-B	15	272	659	15,184	15,843	2,961	1,222	4,183	412
4-C	<u>12</u>	<u>687</u>	<u>299</u>	<u>3,139</u>	<u>3,438</u>	<u>4,664</u>	<u>993</u>	<u>5,657</u>	<u>683</u>
Subtotal	58	961	1,009	166,842	167,851	7,625	2,215	9,840	1,095
5-A	5	128	50	0	50	1,415	0	1,415	0
5-B	20	1,589	578	47	625	10,329	0	10,329	0
5-C	23	1,568	12	0	12	9,403	0	9,403	0
5-D	<u>3</u>	<u>384</u>	<u>5</u>	<u>0</u>	<u>5</u>	<u>2,913</u>	<u>57</u>	<u>2,970</u>	<u>0</u>
Subtotal	48	3,669	645	47	692	24,060	57	24,117	0
6-A	5	0	3,769	0	3,769	2,782	0	2,782	926
6-B	20	375	42,232	152	42,384	11,809	0	11,809	5,360
6-C	<u>8</u>	<u>492</u>	<u>10,249</u>	<u>183</u>	<u>10,432</u>	<u>3,138</u>	<u>56</u>	<u>3,194</u>	<u>720</u>
Subtotal	33	867	56,250	335	56,585	20,564 ^{b/}	56	20,620 ^{b/}	7,688 ^{b/}
Totals	139	5,497	57,904	167,224	225,128	52,249 ^{b/}	2,328	54,577 ^{b/}	8,783 ^{b/}

^{a/} all data preliminary.

^{b/} includes ADF&G test fish catches made between 8/17 and 9/11.

